

A STUDY AND ANALYSIS OF IoT THROUGH MOBILE PHONES AMONG ENGINEERING COLLEGES IN TAMILNADU: A SYSTEMATIC REVIEW

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Abstract

The objective of this research study is to determine the level of understanding as well as the use of people understanding the Web of points among instructors' engineering college computer science departments. In this paper the scientist has actually made use of variables like Wearables, Healthcare, Automotive, Smart retail as well as Smart House to find out the performance of Net of things among the respondents. The main motive of this paper is to understand the degree of understanding and usage of IoT through mobile phones. The devices we are going to utilize in this paper is Pearson connection evaluation, in order to find out the stamina of the relationship between two variables. Detailed research study design and also a practical arbitrary tasting approach are used in this paper to collect the data from the respondents via Google kinds. The sample size of the research study contained 150 respondents. It is discovered that there is a lack of awareness and also usage of IoT through mobile phones among the respondents.

Keywords: *IoT Awareness, IoT Applications, Wireless Network, Internet Connected Device.*

I- Introduction

Internet has become a part of every individual's life and the need and dependency are increasing each day. With the passage of time, things have shifted from just Internet to Internet of Things. The IOT concept was coined by a member of the Radio Frequency Identification (RFID) development community in 1999, and it has recently become more relevant to the

practical world largely because of the growth of mobile devices, embedded and ubiquitous communication, cloud computing and data analytics. Imagine a world where billions of objects can sense, communicate and share information, all interconnected over public and private Internet Protocol (IP) networks. These interconnected objects have data regularly collected, analyzed and used to initiate action, providing a wealth of intelligence for planning, management and decision making. This is the world of the Internet of Things (IOT). The “Internet of things” (IoT) may be turning into a progressively developing subject sentence of discussion both in the work environment and outside for it. It’s an idea that not best need the possibility will sway how we live as well as how we worth of effort. Be that the thing that precisely is the “Internet of things” and what effect will be it setting off to have on you, if any? **Morgan J. (2013)**. Internet of things may be revolving around expanded machine on machine correspondence step by step. It is a chance that expand on cloud computing and networks from claiming physical article: **Burrus. D (2015)**. Internet of things need settled on a large number invention. Some of the most punctual ventures bring started to pay off, for advanced mobile thermostats, wearable wellness devices, Furthermore other innovations turning into standard. For new IoT items under improvement or as of late propelled going starting with medical-monitoring frameworks should sensors for cars, some examiners accept that the Internet of things will be poised for considerably more excellent additions? **Bauer H., Patel M. and Veira J. (2015)**. Talking at Fortune’s worldwide gathering, he predicted that 500 billion gadgets might be associated with the internet by 2025. **Skarmeta A. F., Hernandez-Ramos J. L. and Moreno M. V. (2014)**.

II - Wearables

Wearable devices are a hot topic these days, as illustrated by the new \$5,000 "Make it Wearable" challenge recently issued by Intel. Health- and fitness-oriented wearable devices that offer biometric measurements such as heart rate, perspiration levels, and even complex measurements like oxygen levels in the bloodstream are also becoming available. Technology advancements may even allow alcohol levels or other similar measurements to be made via a wearable device. The ability to sense, store, and track biometric measurements over time and then analyze the results, is just one interesting possibility. Tracking body temperature, for example, might provide an early indication of whether a cold or the flu is on the way. Wearable devices could be allowed to automatically connect to devices around the home too.

III- Healthcare

The healthcare industry is in a state of great despair. Healthcare services are costlier than ever, global population is aging and the number of chronic diseases is on a rise. Medical diagnostic consumes a large part of hospital bills. Technology can move the routines of medical checks from a hospital (hospital-centric) to the patient's home (home-centric). The right diagnosis will also lessen the need of hospitalization. A new paradigm, known as the Internet of Things (IoT), has an extensive applicability in numerous areas, including healthcare.

IV- Automotives

Internet of things, or devices connected over a network, is no longer a fancy technology for the future. It's here and fast changing the way we live. In the automotive sector, IoT has enabled greater transportation efficiency and management capabilities and is leading us to a future of intelligent, autonomous vehicles. According to Net scribe's market research, the global automotive IoT market is expected to reach USD 106.32 billion by 2023, driven by the ever-increasing need for saving time and maximizing productivity in the fast-paced world.

V- Smart Home

A smart home environment is meant to be a small physical world, consisting of different devices, including sensors, actuators, displays and computational elements interacting and exchanging information with users to provide them with automated, customized, and secured services. For example, smart homes are mainly designed for old-age people because such homes are capable of sensing, processing and relaying their important health information and communicating the data through integrated devices and networks to protectors. Moreover, smart homes can help old-age people to live an independent and better life.

VI- Smart Retail

Power shelf technology enables stores to transform their customer service relationships and provide consumers with a seamless shopping experience, while meeting, and surpassing, the expectations of increasingly tech-savvy consumers.

By combining low-power, battery-free hardware with real-time digital analytics, Power shelf helps retailers better manage inventory, reduce out-of-stock products, and increase their operational efficiency.

VII- Review of Literature

According to the **Gartner** Research report on the IoT, billions of connected things are already in use in 2015 and that number will reach 25 billion in just a few short years. **Atzori (2010)** provided the readers with a description of the different visions of the IoT paradigm coming from different scientific communities and reviews the enabling technologies and illustrates which are the major benefits of spread of this paradigm in everyday-life. **Borgia (2014)** reviews the three different phases with which the physical-cyber world interaction takes place: (i) collection phase (procedures for sensing the physical environment, collecting real-time physical data and reconstructing a general perception of it); (ii) transmission phase (mechanisms to deliver the collected data to applications and to different external servers); and (iii) process, management and utilization phase (by service-oriented architecture, cloud computing or peer-to-peer systems). **Lee (2015)** presents five IoT technologies that are essential in the deployment of successful IoT-based products and services and discusses three IoT categories for enterprise applications used to enhance customer value. Because of the potential but uncertain benefits and high investment costs of the IoT, firms need to carefully assess every IoT-induced opportunity and challenge to ensure that their resources are spent judiciously. **Qin.Y, Sheng.Q.Z, Falkner.N.J, Dustdar.S, Wang.H, Vasilakos. A.V (2016)** study and discusses state-of-the-art techniques of IoT from the data-centric perspective. According to **Nordrum (2016)**, IoT is expected to offer classy connectivity that goes beyond machine-to-machine (M2M) communications. **Razzak, F. (2012)** says the Internet of Things (IoT) enabled users to bring physical objects into the sphere of cyber world. According to **Shao, W. and Li, L. (2009)** IoT, which is integrated with Sensor Technology and Radio Frequency Technology, is the ubiquitous network based on the omnipresent hardware resources of Internet, is the Internet contents objects together. According to **Sun, C. (2012)** Radio Frequency Identification (RFID) is a system that transmits the identity of an object or person wirelessly using radio waves in the form of a serial number.

VIII- Need of the Study

According to BCC Research 2011 market report on sensors, the global market for sensors was around \$56.3 billion in 2010. In 2011, it was around \$62.8 billion. The global market for sensors is expected to increase to \$91.5 billion by 2016, at a compound annual growth

rate of 7.8%. One of the techniques for connecting everyday objects into networks is radio frequency identification RFID technology. **E. Welbourne, L. Battle, G. Cole, K. Gould, K. Rector, S. Raymer, M. Balazinska, and G. Borriello (2009)**. In this technology, the data carried by the chip attached to an object is transmitted via wireless links. RFID has the capability to convert dumb devices into comparatively smart objects. RFID systems can be used wherever automated labelling, identification, registration, storage, monitoring, or transport is required to increase efficiency and effectiveness. According to Frost & Sullivan (2011), the global RFID market was valued at from \$3 billion to \$4 billion in 2009. The RFID market will grow by 20% per year through 2016 and reach a volume of approximately from \$6.5 billion to almost \$9 billion. According to Figure 3, it is expected that five main sectors, education, transportation, industry, healthcare, and retails, will generate 76% of the total RFID market demand by 2016.

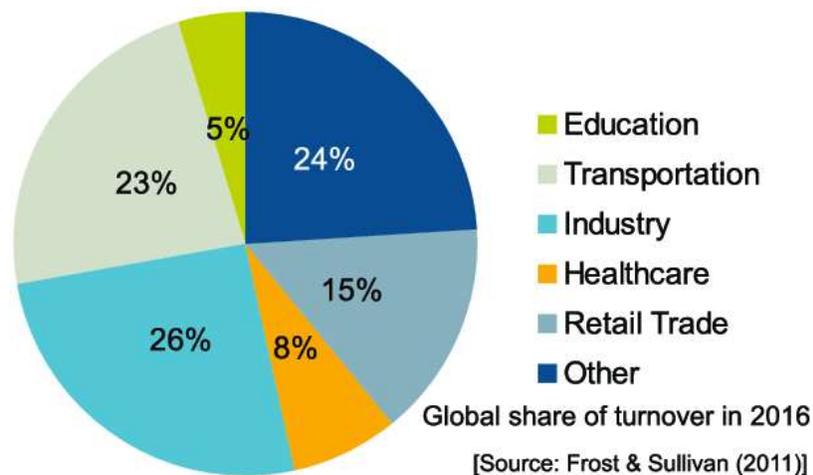
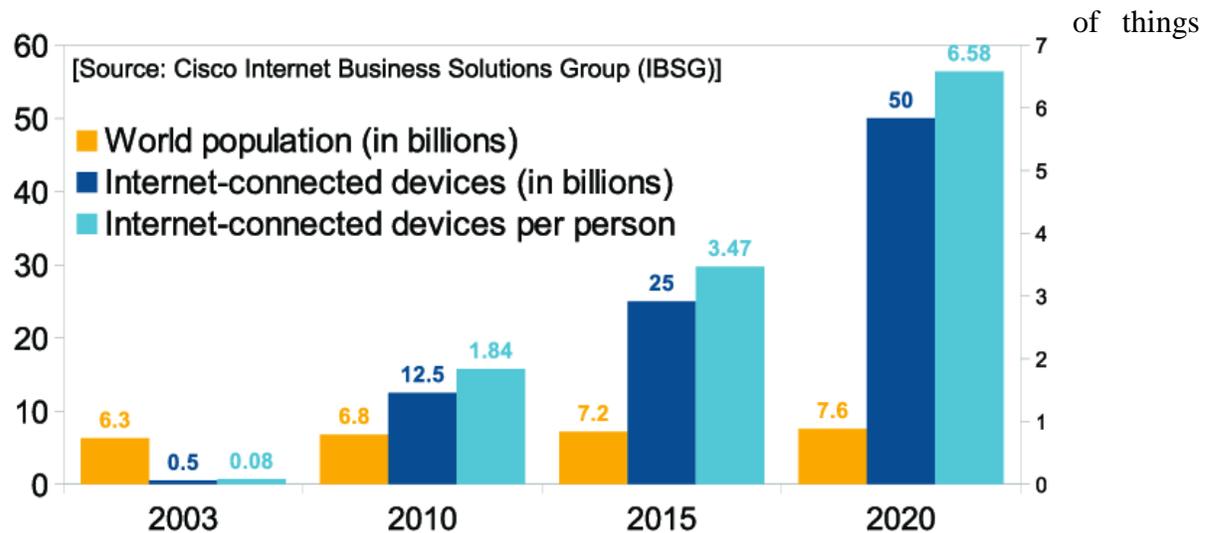


Figure3: RFID Sales by Major Market Segments

Scope of the Study

The vision of the IoT has been heavily energised by statistics and predictions. In this section, we discuss some of the statistics and facts related to the IoT which allows us to understand how the IoT has grown over the years and how it is expected to grow in the future. Further, these statistics and facts highlight the future trends in the industry marketplace. It is estimated that there about 1.5 billion Internet-enabled PCs and over 1 billion Internet-enabled mobile phones today. These two categories will be joined by Internet-enabled smart objects. **G. Kortuem, F. Kawsar, D. Fitton, and V. Sundramoorthy (2010) & L. Atzori, A. Iera, and G. Morabito(2014)**. In the future by 2020, there will be 50 to 100 billion devices connected to the Internet, ranging from smartphones, PCs, and ATMs (Automated Teller Machine) to

manufacturing equipment in factories and products in shipping containers. **C. Perera, A. Zaslavsky, P. Christen, and D. Georgakopoulos (2014)**. As depicted in Figure 1, the number



connected to the Internet exceeded the number of people on Earth in 2008. According to CISCO, each individual on earth will have more than six devices connected to the Internet by 2020.

Growth in Internet-Connected Devices / Objects by 2020

IX-Focus of the Study

- To identify the level of awareness of people knowing the Internet of things among teachers in private engineering college in Trichy.
- To find out the efficiency of Internet of things among teachers in private engineering college in Trichy.
- To analyze the usage of Internet of things among teachers in private engineering college in Trichy.

X-Research Approach

Descriptive Research design is used in this research paper in order to study the individual characteristics of the respondents. A convenient random sampling method is used in this study to collect the data from the respondents through the Google forms.. The sampling unit of this study was conducted among teachers in private engineering college located at Tiruchirappalli district with special reference to TamilNadu. The sample size of the study consisted of 150 respondents. The tools used in this paper are percentage analysis and Pearson correlation analysis.

XI- Limitations

- The suggestions given by the respondents are not constant because the mindset of the respondents may be changed.
- Due to time and economic constraints of the research, the number of respondents is limited to 150.
- The study mainly covered in the area of Trichy only, the opinion of the respondents can be varied to several areas.

Reliability Statistics:

Cronbach's Alpha	No Of Items
0.895	30

Reliability Analysis

The Cronbach's alpha values (0.895) for the scales exceed the minimum requirements, thereby demonstrating that the scales are internally consistent and have acceptable reliability values in their original form in this study.

		Wearables	Healthcare	Smart Home	Healthcare	Smart Retail	Healthcare	Automotive	SmartRetail
Wearables	Pearson Correlation	1	0.128	1	.485**	1	.350**	1	.472**
	Sig. (2-tailed)		0		0		0		0
	N	150	150	150	150	150	150	150	150
Healthcare	Pearson Correlation	0.128	1	.485**	1	.350**	1	.472**	1
	Sig. (2-tailed)	0		0		0		0	
	N	150	150	150	150	150	150	150	150

Pearson Correlation Analysis Relationship between Variables

XII- Findings

- 54% of the respondents are Female and 46% of the respondents are Male.
- 60% of the respondents were aged between 23-30 years, 33% of the respondents were aged between 31-40 years, and 07% of the respondents were aged between 41-50 years.
- 76% of the Educational Qualification of the respondents is Post Graduate, 17% of the Educational Qualification of the respondents is M.Phil, and 7% of the Educational Qualification of the respondents is Doctorate.
- 71% of the Monthly Income of the respondents are ranged between 10,000 – 20,000 Rs., 53% of the Monthly Income of the respondents are ranged between 20,000 – 30,000 Rs, 15% of the Monthly Income of the respondents are ranged between 30,000 – 40,000 Rs, 10% of the Monthly Income of the respondents are < 10,000 Rs, 1% of the Monthly Income of the respondents are ranged between 40,000 – 50,000 Rs.
- 37% of the respondents were Experience between 1 -5 Years, 24% of the respondents were Experience between 5 -10 Years, 21% of the respondents were Experience < 1 Years, 17% of the respondents were Experience between 10 -20 Years, 1% of the respondents were Experience >50 Years.
- 51% of the Marital Status of the respondents is Single, 46% of the Marital Status of the respondents is married and 3% of the Marital Status is widowed.
- 85% of the respondents are aware of IoT and 15% of the respondents are not aware of IoT.

Pearson Correlation

- From correlation analysis, it is inferred that wearables, healthcare, smart retail, automotive and smart home are negatively associated with the Internet of Things.

XIII- Suggestions

From the study most of the respondents were used the wearables, since the customer demand is higher on using the wearables in all aspects of usage of Internet of Things. Customer is ready to purchase wearables, but the awareness on using IoT is to be improved. From the study it is found that most of the respondents were aware of using Internet of Things in healthcare, but people in Tamil Nadu use only limited Internet of Things device in the field of healthcare. Many awareness programs have to be initiated by the government to the public. From the study most of the respondents are not aware of using Internet of Things in the field of

automotive. Since majority of the drivers in Tamil Nadu is not educated so they found some difficulty in understanding and using the Iot device. Drivers who are using IoT will be given proper guidance to know the advantage of using IoT. From the study it is found that people who are all the frequent users of using internet for purchase will have an adequate knowledge on usage of Internet of Things in retail industry. From the study most of the respondents were aware of usage of Internet of Things in the field of smart home. Industry could come forward to educate the customer. Security of home is to be communicated clearly to the users.

XIV- Conclusion

The main aim of conducting this research was to identify the factors which influence more on using of Internet of Things. The study has been conducted on different factors such as wearables, healthcare, automotive, smart retail and smart home. In this study, we reviewed existing literature in the field of Internet of Things in various aspects in order to establish a base for our analysis. Our sample consisted of 150 respondents and the analysis was made on data collected. The findings revealed that all the five factors have a significant impact on using of Internet of Things. It is also revealed that how factors impact Internet of Things have different effects in different factors of individuals. It is also noted that students, who are the future customers will need more awareness in usage of Internet of Things.

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